WHAT IS CLAIMED IS:

1. A system for processing a semiconductor substrate at an elevated temperature, the system comprising:

a processing chamber for processing the semiconductor substrate;

a gas supply configured to inject gas into the processing chamber;

a heating unit configured to provide heat to the semiconductor substrate during processing, the heating unit comprising a doped ceramic heating element at least partially embedded in an undoped ceramic material; and

wherein the coefficient of thermal expansion of the doped ceramic heating element is substantially the same as the coefficient of thermal expansion of the undoped ceramic material.

2. The system of claim 1, wherein the doped ceramic heating element and the undoped ceramic material comprise silicon carbide.

3. The system of claim 2, wherein the dopant of the doped ceramic heating element comprises nitrogen.

4. The system of claim 3, wherein the dopant level of nitrogen within the doped ceramic heating element is between about 150 and 2000 ppm.

5. The system of claim 2, wherein the doped ceramic heating element is at least partially embedded in the undoped ceramic material to form a monolithic plate.

6. The system of claim 5, wherein the plate comprises a susceptor for supporting the semiconductor substrate during processing.

7. The system of claim 5, wherein the plate includes at least one substantially oval shaped aperture formed therein for allowing passage of a substrate support pin, the substantially oval shaped aperture having a major axis

substantially parallel to a radius of the plate and sized to allow thermal expansion of the plate.

8. The system of claim 1, wherein the doped ceramic heating element forms a continuous electrical path, and wherein the undoped ceramic material holds the doped ceramic heating element in a fixed shape.

9. The system of claim 8, wherein the continuous electrical path comprises a plurality of concentric loops that alternate direction.

10. The system of claim 1, wherein the doped ceramic heating element is completely embedded within the undoped ceramic material.

11. The system of claim 10, wherein the undoped ceramic material provides a conductive heat path between adjacent portions of the doped ceramic heating element.

12. The system of claim 1, wherein the doped ceramic heating element and the undoped ceramic material comprise at least one of aluminum oxide, boron nitride and silicon nitride.

13. The system of claim 1, wherein the dopant of the doped ceramic heating element comprises at least one of boron, arsenic, antimony and phosphor.

14. The system of claim 1, wherein the doped ceramic heating element has an electrical resistivity ranging from about 2 to about 5 orders of magnitude less than the electrical resistivity of the undoped ceramic material.

15. A resistive heater for heating a semiconductor processing chamber, the resistive heater comprising:

a doped ceramic heating element shaped to form at least one continuous electrical path;

an undoped ceramic material encasing at least a portion of the doped ceramic heating element to form a monolithic plate; and

wherein the coefficient of thermal expansion of the doped ceramic heating element is substantially the same as the coefficient of thermal expansion of the undoped ceramic material.

16. The resistive heater of claim 15, wherein the doped ceramic heating element and the undoped ceramic material comprise silicon carbide.

17. The resistive heater of claim 16, wherein the dopant of the doped ceramic heating element comprises nitrogen.

18. The resistive heater of claim 17, wherein the dopant level of nitrogen within the doped ceramic heating element is between about 150 and 2000 ppm.

19. The resistive heater of claim 15, wherein the plate comprises a susceptor configured to support a semiconductor substrate during processing.

20. The resistive heater of claim 15, wherein the plate includes at least one substantially oval shaped aperture formed therein for allowing passage of a substrate support pin, the substantially oval shaped aperture having a major axis substantially parallel to a radius of the plate and sized to allow thermal expansion of the plate.

21. The resistive heater of claim 15, wherein the continuous electrical path comprises a plurality of concentric loops that alternate direction.

22. The resistive heater of claim 15, wherein the doped ceramic heating element is completely encased within the undoped ceramic material.

23. The resistive heater of claim 15, wherein the doped ceramic heating element and the undoped ceramic material comprise at least one of aluminum oxide, boron nitride and silicon nitride.

24. The resistive heater of claim 15, wherein the dopant of the doped ceramic heating element comprises at least one of boron, arsenic, antimony and phosphor.

25. The resistive heater of claim 15, wherein the thickness of the resistive heater ranges from about 0.1 to about 0.3 inches.

26. The resistive heater of claim 15, wherein the doped ceramic heating element has an electrical resistivity ranging from about 2 to about 5 orders of magnitude less than the electrical resistivity of the undoped ceramic material.

27. The resistive heater of claim 15, wherein the doped ceramic heating element forms at least two separate electrical paths to provide at least two separate heating zones.

28. A method of making a resistive heater for use in fabricating integrated circuits at an elevated temperature, the method comprising:

removing a portion of a doped silicon carbide layer to form at least one continuous electrically conductive trace; and

after the step of removing, forming a layer of undoped silicon carbide over at least a portion of the at least one trace to form a monolithic plate.

29. The method of claim 28, wherein the step of removing comprises plunge cutting the portion of a doped silicon carbide layer.

30. The method of claim 28, wherein the step of removing comprises electric discharge machining the portion of a doped silicon carbide layer.

31. The method of claim 28, wherein the step of removing comprises etching the portion of a doped silicon carbide layer.

32. The method of claim 28, further comprising depositing silicon carbide and a dopant on a first layer of undoped silicon carbide to form the layer of doped silicon carbide.

33. The method of claim 32, wherein the dopant comprises nitrogen.

34. The method of claim 28, further comprising:

depositing silicon carbide and a dopant on a graphite support to form the layer of doped silicon carbide; and

removing the graphite support after forming the layer of undoped silicon carbide.

35. The method of claim 34, further comprising forming a second layer of undoped silicon carbide over the at least one trace to completely encapsulate the at least one trace.